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ABSTRACT

Based on an analysis of the nature of theory that is relevant to teachers, this paper presents an approach to teacher education, the realistic approach, and reports on its use in two countries. The paper uses the concepts of episteme and phronesis to introduce a new way of looking at theory that is relevant for teacher development. Section 1 examines the traditional approach to teacher education. Section 2 describes the causes of the transfer problem in teacher education and how it blockades teacher development. Section 3 focuses on the new paradigm, noting that ideas developed in the paper are derived mainly from theories on mathematics learning and teaching. Section 4 presents realistic mathematics education as an example. Section 5 describes realistic teacher education. Section 6 examines theory. Section 7 discusses the promotion of reflection. Section 8 describes the introduction of the realistic approach into teacher education at Queen's University in Canada and Utrecht University in the Netherlands. Section 9 concludes by discussing how the realistic approach can narrow the gap between theory and practice, noting that certain issues need special attention. It examines the demands that the principles discussed in this paper put on teacher educators. (Contains approximately 69 references.) (SM)

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Building teacher education on what we know about teacher development

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Abstract

The pressure towards more school-based teacher education programs, visible in many countries, creates a need to rethink the relationship between theory and practice. The traditional application-of-theory model appears to be rather ineffective and is currently being replaced by other, more reflective approaches.
A theoretical basis is presented for a new paradigm in teacher education. It uses the concepts of episteme and phronesis to introduce a new way of looking at theory that is relevant for teacher development. Building on this theoretical framework, the so-called 'realistic approach' to teacher education is introduced. Experiences with realistic approaches in two countries are described.

Introduction

The pressure towards more school-based programs which is visible in many countries is a sign that not only teachers, but also parents, and politicians are often dissatisfied with teacher education (Barone et al. 1996, p. 1108-1109; Ashton, 1996). In Great Britain, for example, a major part of preservice teacher education has now become the responsibility of the schools, creating a situation in which to a large degree teacher education takes the form of "training on the job". The argument for this tendency is that traditional teacher education programs are said to fail in preparing prospective teachers for the realities of the classroom (Goodlad, 1990).
Teacher educators would object that a professional teacher should acquire more than just practical tools for managing classroom situations and that it is their job to present student teachers with a broader view on education and to offer them a proper grounding in psychology, sociology and so on. Although these are valid arguments, the polarisation that is characteristic of this type of discussion is dangerous as it focuses on the question whether teacher education should start with theory or practice instead of the more important question of how to integrate the two in such a way that it enhances teacher development. This latter question, fundamental to the effectiveness of teacher education, is seldom discussed in depth in the professional literature. Based on an analysis of the nature of theory that is relevant to teachers, we will present a new approach to teacher education, the so-called *realistic approach* and report about its use in two countries.

The traditional approach to teacher education

During the last century an enormous amount of psychological, sociological, and educational research has been carried out, offering us a body of knowledge which in principle can be very useful to teachers. It seems reasonable to try and disseminate this knowledge. In fact in many professions a major aspect of the professionalization process has been the introduction of an extensive theoretical basis for the practitioner's work (McCullough, 1987; Hoyle & John, 1995). In teacher education the desire to use as much of the available knowledge as possible, has led to a conception of teacher education as a system in which experts, preferably working within universities, teach this knowledge to prospective teachers. In the best case they also try to stimulate the transfer of this knowledge to the classroom, for example by assignments to be carried out during field experiences. This is how teacher education became known as "teacher training" (Bullough & Gitlin, 1994). To quote Shulman (1986): "Teacher education programs in general seem to be based on the view that teacher candidates will teach effectively once they have acquired subject matter knowledge, got acquainted with models of innovative curriculum and have practiced using them". Schön (1987) called it the "technical-rationality model". Imig and Switzer (1996, p. 223) state that in many places in the world the tendency to focus on knowledge bases to be taught to prospective teachers has become even stronger. This emphasis on expert-knowledge (Sprinthall et al., 1996), dominant for many decades, basically has not changed, although many studies have shown its failure in strongly influencing the practices of the graduates of teacher education programs. Zeichner and Tabachnick (1981), for example, showed that many notions and educational conceptions, developed during teacher

education, were "washed out" during field experiences (compare Bullough, 1989). Lortie (1975) presented us with another early study into the socialization process of teachers, showing the dominant role of practice in shaping teacher development. At Konstanz University in Germany large scale research has been carried out into the phenomenon of the "transition shock" (Müller-Fohrbrodt et al., 1978; Dann et al., 1978; Dann et al. 1981; Hinsch, 1979), which regrettably went largely unnoticed by the English-speaking research community. It showed that teachers pass through a quite distinct attitude shift during their first year of teaching, in general creating an adjustment to current practices in the schools, and not to recent scientific insights into learning and teaching. Building on the work of the Konstanz research group Brouwer (1989) did an extensive quantitative and qualitative study in the Netherlands, also showing the dominant influence of the school on teacher development. He found that an important factor promoting transfer from teacher education to practice was the extent to which the teacher education curriculum had an integrative design, i.e. the degree to which there was an alternation and integration of theory and practice within the program. We will return to this issue later.

The transfer problem

Much is known about the causes of the transfer problem and how it blockades teacher development (see also Wubbels et al., 1997). Using a cognitive-psychological perspective, we will mention three major causes here:

1 A first cause has to do with the learning process within the teacher education institute itself, even before the implementation stage. Research on learning and teaching shows that prior knowledge plays a powerful role in comprehension and learning (Scardamalia & Bereiter, 1989). Students in teacher education do have *preconceptions* about learning and teaching (Wubbels, 1992), but these notions often do not agree with the theories taught in teacher education programs. Preconceptions show a remarkable resistance to traditional attempts to change them (Wahl et al., 1984), which can in part be explained by their firm roots in the many years of experiences that student teachers themselves have had as students within the educational system (Lortie, 1975). Stofflett and Stoddart (1994) for example, argue that teachers' conceptions of teaching subject matter are strongly influenced by the way in which they themselves learned this subject content. They have shown that student teachers who themselves experienced learning in an active way, are more inclined to plan lessons that facilitate students' active knowledge construction. Huibregtse et al. (1994) showed that even with experienced teachers there is a strong relationship between their preferred way of teaching and the way they themselves are used to learn: they have a limited view of the learning styles of their students and tend to project their own way of learning onto the learning of their students.

2 Another, more fundamental cause has been named the *feed-forward* problem: "resistance from the student teacher at the time of exposure to given learnings and, later, protestations that the same learning had not been provided in stronger doses" (Katz et al., 1981, p. 21; see also Bullough et al., 1991, p. 79). This problem can also be stated as follows: in order to learn anything during teacher education, student teachers must have personal concerns about teaching or they must have encountered concrete problems. Otherwise the fruitfulness of the theory is not clear to them and they are not motivated to study it. In fact this is nothing more than a concretization of the well-known principle that learning only takes place if the learner has some personal goal which is, in the view of this person, served by the learning (Skemp, 1979). And even if there are such personal goals, for example because the student teachers have developed concerns during their teaching in school, general theory is only helpful if there is some kind of coaching of the student teachers in connecting the theory to their actions in the concrete practical situations in which they encounter their problems (Joyce & Showers, 1988).

3 A third cause has to do with the *nature of the relevant knowledge*. Clark & Lampert (1986, p. 28) state that once inside school, teachers "are expected to accomplish complex and even conflicting goals. Under these circumstances, a priori knowledge identified by researchers about the relationship among particular decisions or actions and their outcomes is of limited worth". Teachers need quick and concrete answers to situations in which they have little time to think.

This type of action-guiding knowledge is rather different from the more abstract, systematized and general expert-knowledge teacher educators often present to student teachers (Korthagen & Lagerwerf, 1996; Tom, 1997). This issue will be further elaborated in this paper, as we consider it one of the major reasons for the lack of success of teacher education all over the world.

Although the transfer problem in teacher education is well-known and its causes have been thoroughly researched, it is remarkable that many teacher education programs still reflect the traditional "application-of-theory model" described above (Korthagen & Russell, 1995), although it is hard to derive reliable conclusions about this from the literature. Zeichner (1987) once noted that very little is published about concrete strategies and program arrangements. In our own work as trainers of teacher educators in various countries we did have the opportunity to analyze the "everyday pedagogy" of teacher education. It led us to conclude that basically the traditional view of teacher education has not changed and even that many "new" approaches often take the form of sophisticated procedures to try and interest student teachers in a particular theory, or bridge the gap between the theory presented and teaching practice. This means that the traditional approach, in which teacher educators make an *a priori choice* about the theory that should be transferred to student teachers, represents a very dominant line of thought (compare also Oldfather et al., 1994 and Bullough & Gitlin, 1994). The fundamental conception inherent to this line of thought is that there is a gap to be bridged. One often forgets that it was the a priori choice that created this gap in the first place.

Towards a new paradigm

Although the application model represents the general picture, there are interesting exceptions (see for example Zeichner, 1995; Clandinin, 1995; Richardson, 1997), but they are often realized by a few isolated educators within an institute, not seldom heavily criticized by their colleagues. As a reaction to weaknesses of the traditional approach to teacher education, such innovative educators have developed new ways of preparing teachers for their profession. Many of these attempts can be characterized by an emphasis on reflective teaching (Calderhead, 1989), implying that teacher development is conceptualized as an ongoing process of experiencing practical teaching and learning situations, reflecting on them under the guidance of an expert and developing one's own insights into teaching through the interaction between personal reflection and theoretical notions offered by the expert.

In many teacher education programs this alternative view is currently being worked out. Impressive steps were made towards the construction of a theoretical basis for such an approach, for example by formulating the cognitive psychological underpinnings, mostly in terms of constructivism (e.g. Oldfather et al., 1994; Bell & Gilbert, 1996), or sociological considerations, generally in terms of goals to strive for and methods to reach these goals (e.g. Zeichner, 1983; Liston & Zeichner, 1990) and the ethical dimensions involved (Zeichner, 1986). Research into strategies and effects has also been published (for example Zeichner, 1987; Zeichner & Liston, 1987; Gore & Zeichner, 1991).

In one respect the theoretical basis underlying such new approaches to teacher education is meager, viz. with regard to the role of theory. Compared to the traditional theory as found in academic textbooks, 'theory' takes on a completely different form in a program aiming at a real contribution to teacher development. The aim of the present paper is to emphasize this point and to look at its consequences.

The ideas developed in this paper are to a large degree derived from theories on mathematics learning and teaching. In fact mathematics education appears to be a domain where many problems have been first spotted (and also partly solved) which are very similar to the kind of problems inherent in teacher development. However, the connection between these two domains has seldom been made. Without trying to dive into mathematics education too deeply here, a short overview of relevant developments in this domain may thus be helpful to our thinking about teacher development.

Mathematics education as an example

For two reasons mathematics education is an interesting field on which to build our thinking about teacher education. The first is that to many children and thus also to teachers, mathematics causes so much trouble. This implies that the need is very strong to find productive ways of helping children acquire the necessary knowledge and skills in a way that helps them to apply them. It has promoted the development of a theory about learning and teaching mathematics, which is directly relevant to classroom practices. Secondly, as mathematics as a field of study can more easily be isolated from other knowledge domains, psychologists have here been rather successful in discovering the mechanisms underlying learning.

One of the most impressive recent developments in education has been the introduction of so-called 'realistic mathematics education' (Treffers, 1987; Freudenthal, 1991). It can be characterized by a complete break with the traditional approach which goes from 'theory' (principles, rules, theorems) to 'practice'. For many years, children in mathematics classes had to learn to apply to practical problems mathematical structures, developed during centuries of study in mathematics. Although with sufficient support they often succeeded in working their way through series of textbook problems, in ordinary life these children were often unable to solve the simplest everyday problems, even when these problems were similar to those in the math class (Schoenfeld, 1987). In other words, a transfer problem was very obvious in mathematics education.

The great mathematician and mathematics educationalist Hans Freudenthal analyzed this transfer problem and pointed out how in fact the traditional didactic approach contradicted the essential nature of mathematics. In his view, mathematics is not "a created subject" to be transferred to children, but "a subject to be created". When one pursues his line of thinking, mathematics becomes, or rather has always been, a *human activity*, based in the reality of the world around us. (This is why he called the approach "realistic".) Activity leads to consciousness of structures underlying the problems at hand. These structures, constructed by the learner, represent his or her idiosyncratic way of making meaning out of a problem situation. This means that these cognitive structures are closely connected to the way the learner will deal with similar problem situations in the future.

The realistic approach towards mathematics, as developed by Freudenthal, started in the seventies in the Netherlands, and through the work of the Freudenthal Institute at Utrecht University it has now spread to many other countries as well, for example to the United States, where it fitted into ideas about changing mathematics education, developed in the 80s. An important starting point in the realistic approach is the assumption that students can and should themselves develop mathematical notions on the basis of practical experiences and problems. The problems are presented within a context recognizable for children, and often taken from everyday situations. Emphasis is put on the *practical use* of mathematics, *inquiry* and *reflection*, *group work* and *hands-on activities*. Freudenthal characterizes the resulting teaching and learning process as one of *guided reinvention* (a term also used by Fischer & Bullock, 1984). To put it in its shortest form, the realistic approach goes from practice to theory. An interesting aspect is that the gap between theory and practice disappears, although it is better to say that it is not created by the educational process itself, as is the case in the traditional approach. In cognitive psychological terms one can say that the intended learning processes start from 'situated knowledge' (Brown et al., 1989), developed in the interaction of the learners with the problem situations, and that the concrete situations remain the reference points during the learning process. This immensely diminishes the classical 'transfer problem' in application situations. In the next section we will discuss the question what teacher education can learn from the developments in mathematics education.

Realistic teacher education

When comparing traditional approaches to teacher education with the above example of mathematics education, there appear to be striking similarities.

In Freudenthal's terms one could say that in this traditional approach, knowledge about teaching is considered as a created subject and not as a subject to be created by the learner, i.e. the student

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teacher. An approach which would be more in line with Freudenthal's ideas about learning, takes its starting point in real problems as encountered by student teachers during field experiences. The student teacher would then develop his or her own knowledge in a process of reflection on the practical situations in which a personal need for learning was created. As is the case in realistic mathematics education the emphasis shifts towards inquiry-oriented activities, interaction amongst learners, and the development of reflective skills.
In our work with teacher educators and program coordinators, we often hear the concern that this implies that theory will disappear from the teacher education curriculum and that student teachers will have to reinvent the wheel over and over again, the teacher educator's only task being to ask "what do you yourself think"? This is a caricature based on a complete misunderstanding of the processes involved in a realistic approach. During the learning processes involved, the teacher educator has an important role, although completely different from the traditional role of the lecturer. The kind of support that he or she should offer (including theory!) has to be very much adjusted to the specific problems the student teachers are having.

Theory and theory

As a consequence, the nature of fruitful "theory" shifts dramatically from that in the traditional approach. Clark & Lampert (1986, p. 28) state that once inside school, teachers "are expected to accomplish complex and even conflicting goals. Under these circumstances, a priori knowledge identified by researchers about the relationship among particular decisions or actions and their outcomes is of limited worth". Teachers need quick and concrete answers to situations in which they have little time to think. This type of action-guiding knowledge is rather different from the more abstract, systematized and general expert-knowledge that teacher educators often present to student teachers.

Kessels and Korthagen (1996) go back to Aristotle's concepts of *episteme* and *phronesis* to explain the difference. If a teacher educator offers *epistemic* knowledge, he or she uses general conceptions, applicable to a wide variety of situations; this knowledge is based on research and can be characterized as "objective" theory, theory with a big T. This is the type of knowledge that plays a central role in the traditional approach and that should certainly not be omitted from teacher education programs: student teachers should be helped to see the larger picture of educational knowledge. More often, however, they need knowledge that is situation-specific and related to the context in which they meet a problem or develop a need or concern, knowledge that brings their already existing, subjective perception of personally relevant classroom situations one step further. This type of knowledge is called *phronesis*. We could also call it "theory with a small t". The character of *phronesis* is more *perceptual* than conceptual: often quite unconsciously, it focuses the attention of the actor in the situation on certain characteristics of the situation, characteristics important to the question of how to act in the situation. To put it concisely, *episteme* aims most of all at helping us to *know* more about many situations, while the emphasis of *phronesis* is more on *perceiving* more in a particular situation and finding a helpful course of action on the basis of strengthened awareness.
Our hypothesis is that this strengthened awareness is a key factor in teacher development. On the basis of this hypothesis the realistic approach to teacher education has been developed and implemented. Below we explain more about the way this has been done and we report about some first evaluative research studies.

The promotion of reflection

As phronesis, or theory with a small t, is meant to be of help in the process of perceiving practical situations, it can only be relevant to teachers if it builds on their existing perceptions. This requires (1) that teachers become aware of their perceptions of practice, and (2) that they be helped to restructure these perceptions if another way of perceiving is more fruitful. This points to the central role of reflection in teacher development.

In order to escape from the often vague discussions in the literature about this concept, we define reflection as *the mental process of trying to structure or restructure an experience, a problem or existing knowledge or insights* (Wubbels & Korthagen, 1990). Fundamental to our conceptualization of the process of reflection is the close relationship between teachers' actions, their perceptions of these actions, and the possibility of reframing these perceptions. We conceive the reflection process as a spiral (Fig. 1). The spiral represents the alternating stages of acting, learning from the actions and, because of that, improving on the action, and so on. When we look closer at one cycle of the spiral, we distinguish between five phases, which are quite similar to distinctions made in other models for reflection (for example Carr & Kemmis, 1986). Phase 5 is phase 1 of the next cycle.

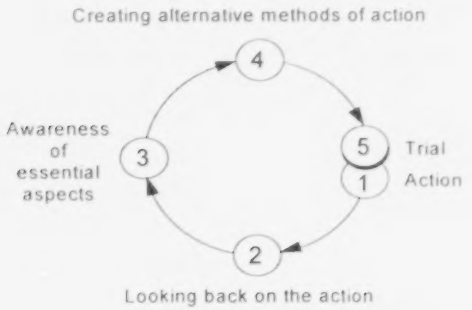

Figure 1: The ALACT model for reflection

This phase model is called the ALACT model, after the first letters of the five phases. Its use in concrete program elements has been described in Korthagen (1985) and evaluated in a series of studies (see for an overview Korthagen, 1993 or Korthagen & Wubbels, 1995).[1]

An important aspect of a realistic approach to teacher education is that teachers are not only stimulated to reflect, but also that they *learn to master the process of reflection itself*. Only then can we speak of *learning how to reflect*. In that case, teacher education promotes a second order change in teachers: they acquire the ability to direct their own professional development and take responsibility for it (*growth competence*).

Introducing the realistic approach into teacher education

The ideas described in this paper are not only philosophical reflections on teacher education: they are built on actual implementations of realistic approaches into teacher education, especially at Queen's University in Canada and Utrecht University in the Netherlands. We will now briefly describe the first experiences with this approach and some research findings.

The program at Queens' University

At Queen's University in Canada, the Faculty of Education introduced a new teacher education program structure, with a pilot program in 1997 paving the way for full implementation of the new structure in 1998. The central feature of the new structure is "early extended teaching experience" in

[1] The reader may wonder why we do not use the well-known model of Kolb (Kolb & Fry, 1975). Our problem with Kolb's model is that it does not account for the non-reflective learning that is an important part of learning (De Jong et al., 1998). It suggests on the one hand, that learning from experience is a natural, almost autonomous process leaving little room for guided learning. On the other hand, it overemphasizes the role of abstract concepts at the cost of concrete and more individual concepts, images, feelings or needs.

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which candidates are placed in schools, in cohorts of six to ten, from the opening day of school in September until the holiday break in December. A week of orientation precedes the entry into schools, and candidates return to the university for two weeks near the midpoint of the 15-week Fall Term placement. Two field-based courses are completed while in schools. The Winter Term includes more traditional education courses, although these are made different by the extensive experiences of candidates in schools. The Winter Term also includes two shorter teaching practice periods; a four-week placement at the conclusion provides an opportunity to experience just how much has been achieved over the entire program.

An extensive period of faculty-wide preparation preceded the full implementation of the new structure. Several retreats were held, and every member of staff was involved in one or more committees to prepare for the transition. Many refinements were made during the pilot program involving 10% of our 1997 candidates. Nevertheless, when full implementation occurred, personal experience generated a host of fundamental issues that require openness, trust and patience of all staff to achieve mutual understanding and shared commitment to the new structure. While many attempts were made to take charge of the personal development of each teacher educator, it remains obvious that the task may always be more challenging than we are willing to admit. At the present stage, some colleagues report dissatisfaction with the major changes involved with the experience-first approach to pre-service teacher education.

For one of us, the shift to a new structure was extremely satisfying. By virtue of significant involvement with a small cohort of experience-rich teacher candidates in 1994-96 and by virtue of his involvement in self-study of teacher education since 1992, Tom Russell found himself ready and able to build on teacher candidates' Fall Term experiences. Working with a group of 26 candidates in chemistry and physics methods, substantial success was achieved by focusing on the significance of pedagogy and on the development of resources in response to questions generated by teaching experiences.

In sum, the shift from a deductive to a realistic approach was successful for this teacher educator and virtually all members of the class group. In a report on this experiment (Russell & Bullock, in press) the most obvious finding appears to be that early extended teaching experience removes many barriers for student teachers that in previous years made the process of professional development difficult. These barriers can be formulated in terms of assumptions about preservice teacher education that are overcome by the realistic approach, assumptions such as "teaching can be told", "learning to teach is a passive process", "theory is largely irrelevant", "experience cannot be analyzed". In the traditional approach students develop a dependency on external authority and propositional knowledge which in fact does not help them very much in practical settings. The realistic approach appears to generate in student teachers a sense of what Munby and Russell (1994) call the *authority of experience*: they start to see their *own* experiences and as valuable ingredients of the process of learning to teach.

The Utrecht program

The teacher education program at Utrecht University preparing for secondary education, has more gradually developed towards the approach described in this paper. This development was marked by the publication, in 1985, of a national report which presented the desired outline of the one-year-post-degree course for prospective teachers at Dutch universities. The report consisted of a clearly described professional teacher profile from which professional competencies were deduced that teacher education should develop. A lot of emphasis in the profile was put on the ability to reflect. For most teacher educators, this was fresh ground. The flow of publicity on reflection by teachers emerged only at the beginning of the 1980's (for example Zeichner, 1981), and much practical experience did not yet exist. Therefore it was decided to combine the introduction of a new teacher education program at Utrecht University with training courses for teacher educators and mentor teachers. These courses aimed at the development of the supervision skills needed for the improvement of reflection on the part of student teachers in their teaching practice. Moreover, a lot of energy was put in meetings of teacher education staff, mentor teachers and school administrators,

in which they together formulated the structural characteristics of the program and the approach to be followed.

This led to a realistic program built around two main teaching practice periods. The first is a four-months period in which the student teachers go to the schools in closely collaborating triads, and gradually start to teach whole classes. Regularly they come back to the institute for group discussions, inquiry about their teaching and structured reflection. The theory provided at the institute is built as much as possible around the student teachers' experiences, questions and concerns. After a two-months period at the institute, devoted to workshops on specific educational issues, further reflection, a small research project and theory based on the experiences from the teaching practice period, the Final Individual Teaching Practice Period starts. During four months the student teacher gets full responsibility for a few classes and is supervised "at a distance" by the mentor teacher who does not visit the lessons. This means that the supervision draws heavily on the student's experiences and reflections. During the whole year much attention is devoted to *learning how to reflect*. (For more details see Koetsier et al., 1997).

An important question is: what are the results of this program? Focusing especially on this question, we briefly present an overview of several published evaluative studies of the Utrecht program. An national evaluation study carried out by an external research office (Research voor Beleid; see Luijten et al., 1995 and Samson & Luijten, 1996) of all Dutch teacher education programs preparing for secondary education has shown that 71% of a sample of graduates of the Utrecht program (n = 81) scored their professional preparation as good or very good (the two highest scores on a five-point scale). This is a remarkable result, as in the total sample of graduates from all Dutch teacher education programs preparing for secondary education (n = 5135) this percentage was only 41% ($p < 0.001$).

A fundamental question is: Does the realistic approach indeed reduce the gap between theory and practice? Several studies focused on this more specific question. In 1991, an evaluative overall study among all graduates of the Utrecht University program between 1987 and 1991 showed that 86% of the respondents considered their preparation program as relevant or highly relevant to their present work as a teacher (Koetsier et al., 1997). Hermans et al. (1993) illustrate this finding with more qualitative data of an experiment with a group of 12 student teachers strictly incorporating all the principles mentioned in the two previous sections. All 12 student teachers reported a seamless connection between theory and practice, a noteworthy result, given the many research reports from all over the world showing the problematic relationship between theory and practice. Some quotes from student teachers' evaluations are: "The integration theory/practice to my mind was perfect"; "Come to think of it, I have seen and/or used all of the theory in practice"; "The things dealt with in the course are always apparent in school practice". Considering the gap between theory and practice found in many research studies on teacher education, these are remarkable results.

Another fundamental question is whether the professional community would consider the knowledge base offered to the student teachers at Utrecht University, which is strongly connected to the student teachers' experiences, to be sufficient. Some valuable indications may be derived from two external evaluations, in 1992 and 1997, by two official committees of experts in teacher education, researchers and representatives of secondary education, instituted by the Association of Dutch Universities (VSNU). The program received very positive assessments. For example, in 1997 the program scored 'good to excellent" on 25 out of 34 criterion variables, including the criteria 'value of program content' and 'professional quality of the graduates'. On the other 9 criteria it received the assessment "sufficient". No other Dutch university teacher education program received such high scores.

However, the 1992 committee did comment on the fact that the final objectives of the program were not formulated at an explicitly concrete level. This was recognized by the program staff. It is a difficulty almost inherent to the realistic approach that it is hard and perhaps even counterproductive to state in advance what the exact course content will be. Perhaps this is the price to be paid for the

shift from an emphasis on episteme towards the development of knowledge, skills and attitudes which are really being used in practice. On the other hand, after 1992, years of experience with the realistic approach have helped the program staff to become able to predict rather precisely what types of problems and concerns are generated by what kinds of practical experiences of student teachers as well as what kind of "theory" can effectively be connected to these problems and concerns. This made it possible to formulate the program objectives more precisely in advance and to not only follow the student teachers' concerns, but also generate them (Van der Valk et al., 1996). This led the 1997 committee to score the degree of "completeness and clarity of the program goals" as good to excellent as well as the degree to which the program goals were achieved. We believe that this is another indication that a new and sound "pedagogy of realistic teacher education" is now evolving.

Discussion

We explained how the realistic approach can indeed narrow the gap between theory and practice, but that there are certain issues that need special attention. In this respect it is important to refer to an extensive study carried out by Brouwer (1989) into the relationship between program design and effects of 24 teacher education curricula (related to 12 different school subjects), in use at Utrecht University during the 80s, i.e. the years in which the realistic approach started to develop. At various moments during these programs and during the first two years in which the graduates worked as teachers, quantitative and qualitative data were collected among 357 student teachers, 31 teacher educators and 128 cooperating teachers. Concrete learning effects on the work of the graduates during their first year in the profession (measured by means of 14 criterion variables) appeared to depend primarily on the degree to which theoretical elements in their preparation program were perceived by the student teachers as functional for practice at the time of their student teaching, and on the cyclical alternation between school-based and university-based periods in the program, Also, a gradual increase in the complexity of activities and demands on the student teachers appeared to be a crucial factor in the professional development of the teachers.

Finally, the principles discussed in this paper put high demands on teacher educators: they must serve as role models and be willing and able to put more responsibility for the learning process in the hands of their students, to create safe learning environments and a climate for reflection and interaction, and to teach students how to develop the metacognitive skills necessary for reflection and for developing a growth competency. This also requires that teacher educators can connect several educational, pedagogical, and psychological perspectives, and academic disciplines.

Obviously, this requires more from teacher educators than is generally part of their preparation for the profession. It is remarkable that, although much attention is being paid to student learning in schools and the professional development of teachers, the professional development of teacher educators is hardly ever discussed (Wilson, 1990). Almost everywhere, becoming a teacher educator without a specific education for this profession is still a reality. A research study into the selection and training of educators in the countries of the European Union, published in a special issue of the European Journal of Teacher Education (1990, vol. 13, # 1/2), showed that the position of teacher educators was generally obtained on the basis of extensive and successful teaching experience and/or an academic education, for example in educational science. This situation does not seem to have changed much and does not differ from that in America and Canada (Ducharme, 1993; Guilfoyle et al., 1995; Korthagen & Russell, 1995). A thorough literature review revealed an almost complete lack of any studies on the subject of the education of teacher educators, although, in many places, training programmes are offered to mentor teachers.

As one of us does have personal experience with giving training courses to teacher educators in many different countries[2] we close by emphasizing that, in our view, the education of teacher

2 Such training courses have been given to on a large scale in the Netherlands, causing a shift in the approaches of many Dutch teacher educators. The training has also been given to teacher educators from a variety of

educators is the necessary starting point for developments in education. Teacher educators, too, learn the most by being stimulated to learn from their own practices by means of reflection and inquiry, and by being provided with helpful theory. Not only do we think that what they learn in this 'realistic' way is more helpful for their practice: Most of all we believe that pedagogical principles should be practised on all educational levels in order to become guiding principles in education.

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